

WHAT IS CLAIMED IS:

1. A method of fabricating a thin film transistor comprising the steps of:
- forming an amorphous silicon layer as an active layer on a substrate;
- forming a gate insulating layer and a gate electrode on the amorphous silicon layer;
- doping impurities of a first conductive type in the amorphous silicon layer;
- forming a metal layer on the exposed portions of the amorphous silicon layer; and
- crystallizing the amorphous silicon layer by applying thermal treatment and electric field to the resultant substrate.
2. The method of fabricating a thin film transistor according to claim 1, wherein the substrate includes one of a glass and an oxide layer on a glass.
3. The method of fabricating a thin film transistor according to claim 1, wherein the substrate is prepared by depositing a silicon wafer or an oxide layer on a silicon wafer.

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4. The method of fabricating a thin film transistor according to claim 1, wherein the gate electrode is formed by at least one transition metal material including Mo, Cr and Co.

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5. The method of fabricating a thin film transistor according to claim 1, wherein the impurities include ~~PH₃~~ ^{PH₃}.

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6. The method of fabricating a thin film transistor according to claim 1, wherein the metal layer has a thickness of no more than 30Å.

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7. The method of fabricating a thin film transistor according to claim 6, wherein the metal layer is formed by at least one transition metal material including Cu, Ni, Fe, Co, Ru, Rh, Pd, Os, Ir, Pt, Se, Ti, V, Cr, Mn, Zn, Au and Ag.

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8. The method of fabricating a thin film transistor according to claim 1, wherein the step of forming metal layers on ~~the doped~~ ^{exposed} portions of the amorphous silicon layer is performed before the step of doping impurities of first conductive type in exposed portions of the amorphous silicon layer.

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9. The method of fabricating a thin film transistor according to claim 1, further comprising a step of forming electrodes for applying a voltage to form the electric field on the resultant substrate.

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10. The method of fabricating a thin film transistor according to claim 9, wherein the electrodes are formed by a metal material including Au, Pt, Fe and Al.

11. The method of fabricating a thin film transistor according to claim 9, wherein the electrodes includes first and second electrodes, and crystallization of the amorphous silicon layer occurs faster at the first electrode than at the second electrode.

12. The method of fabricating a thin film transistor according to claim 9, wherein the electrodes includes a negative electrode and a positive electrode, and crystallization of the amorphous silicon layer occurs faster at the negative electrode than at the positive electrode.

13. The method of fabricating a thin film transistor according to claim 1, wherein the heat treatment is performed at about 500°C.

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14. A method of fabricating a thin film transistor comprising the steps of:

forming a first amorphous silicon layer as an active layer on a substrate;

forming a gate insulating layer and a second amorphous silicon layer as a gate electrode on the first amorphous silicon layer;

doping impurities of a first conductive type in the first and second amorphous silicon layers;

forming a metal layer on the doped portions of the first and second amorphous silicon layers; and

crystallizing the first and second amorphous silicon layers by performing heat treatment and applying electric field on the resultant substrate.

15. The method of fabricating a thin film transistor according to claim 14, wherein the substrate includes one of a glass and an oxide layer on a glass.

16. The method of fabricating a thin film transistor according to claim 14, wherein the substrate is prepared by depositing an oxide layer on a silicon wafer.

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17. The method of fabricating a thin film transistor according to claim 14, wherein the step of forming the gate insulating layer and the second amorphous silicon layer comprises the steps of:

10 depositing an oxide layer and an amorphous silicon layer on the substrate comprising the first amorphous silicon layer;

etching the oxide layer and the amorphous silicon layer using a mask for forming the gate electrode.

15 18. The method of fabricating a thin film transistor according to claim 14, wherein the impurities include p-type or n-type.

20 19. The method of fabricating a thin film transistor according to claim 14, wherein the metal layer has a thickness of no more than 30Å.

20. The method of fabricating a thin film transistor according to claim 14, the step of forming metal layers on the doped portions of the amorphous silicon layer is performed before the step of doping impurities of first conductive type in exposed portions of the first and second amorphous silicon layers.

21. The method of fabricating a thin film transistor according to claim 14, further comprising a step of forming electrodes for ~~to~~ applying a voltage to form the electric field on the resultant substrate.

22. The method of fabricating a thin film transistor according to claim 21, wherein the electrodes are formed by a metal material including Au, Pt, Fe and Al.

23. The method of fabricating a thin film transistor according to claim 21, wherein the electrodes includes first and second electrodes, and crystallization of the amorphous silicon layer occurs faster at the first electrode than at the second electrode.

24. The method of fabricating a thin film transistor
according to claim 21, wherein the electrodes includes a negative
electrode and a positive electrode, and crystallization of the
amorphous silicon layer occurs faster at the negative electrode
5 than at the positive electrode.

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